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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/816,358

Applicant(s)

JUNG ET AL.

Examiner

OLEG SURVILLO

Art Unit

2442

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/CD)
Paper No(s)/Mail Date 05/24/10
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Claims 1-39 remain pending in the application. Claims 1-17, 19, and 33-39 are currently amended. No claims have been canceled. No new claims have been added.

Response to Arguments

2. With regard to applicant's remarks dated August 18, 2010:

regarding the rejection of claims 17 and 38 under 35 U.S.C. 101, applicants' amendment to has been fully considered and is sufficient. Therefore, the rejection has been withdrawn.

Regarding the rejection of claims 1-39 under 35 U.S.C. 112, first paragraph, applicant's amendment has been fully considered and is sufficient with respect to claims 1-37. Therefore, the rejection of those claims has been withdrawn. The rejection of claims 38 and 39 is maintained for the reasons presented below under appropriate section.

Regarding the rejection of claims 1-32 and 34-37 under 35 U.S.C. 112, second paragraph, applicants' amendment has been fully considered and is sufficient with respect to some of the rejected claims. For those claims, the rejection has been withdrawn. For the remaining claims, the rejection is maintained for the reasons presented below under appropriate section.

Regarding the rejection of claims 1-39 under 35 U.S.C. 103(a), applicants' arguments have been fully considered but are moot in view of the new grounds of rejection.

At point 1), applicants argue that *"the USPTO has disregarded its duty to undergo the broadest reasonable interpretation consistent with the specification of Independent Claim 1 by an ill conceived mapping onto the USPTO -cited material, which fails to recite several express recitations of these claims"*. See pages 29-56 of Remarks.

In response to applicant's argument at point 1), it is noted that new grounds of rejection cover every claimed limitation, including newly added limitations of claim 1, as discussed fully in the reasons for rejection. Therefore, applicant's argument cannot be held as persuasive. Examiner makes no admission whether grounds of rejection and mapping presented in the previous Office action, to which applicants respond, would still be appropriate since claim 1 was substantially amended in the applicant's instant response. Thus, new grounds of rejection and mapping of claimed elements onto the cited references is provided below, meeting examiner's burden to establish a prima facie case of unpatentability.

At point 2), applicants argue that *"the USPTO is asserting one or more characterizations that each cited reference "teaches" at least some of the text of Independent Claim 1, but has not provided any objectively verifiable evidence supporting these assertions"*. See pages 29-56 of Remarks.

In response to applicant's argument at point 2), examiner brings applicant's attention to the reasons for rejection of claim 1 where objectively verifiable evidence is provided in the form of cited paragraphs and section of applied references, therefore, meeting examiner's burden to establish a prima facie case of unpatentability.

At point 3), applicants argue that "the USPTO has failed to adduce objective evidence of how to modify/combine the cited art to match the recitations of Independent claim 1". See pages 29-56 of Remarks.

In response to applicant's argument at point 3), examiner brings applicant's attention to the motivation for modifying the teachings of Mulgund, as presented for every claim where motivation is required for a proper combination. In particular, as to claim 1, the motivation was provided at pages 19-20 of the last Office action. Therefore, examiner's burden to establish a prima facie case of unpatentability is met.

As to remaining independent claims and dependent claim 3, applicants present arguments that are analogous to those arguments addressed just above and are not addressed separately for the sake of brevity.

As to any arguments not specifically addressed, they are the same as those discussed above, or previously addressed in the last Office action, the response to which is not repeated for brevity.

Response to Declaration under 37 CFR 1.132

The Declaration of Richard T. Lord has been fully considered but is not deemed sufficient to clearly establish patentable distinction between the claimed invention and the prior art of record for at least the following reasons:

at first, the person signing the Declaration failed to clearly state on the record what facts this Declaration attempts to establish, such as whether applicants attempt to provide evidence of critically and unexpected results, commercial success, long-felt but unsolved needs, failure of others, etc.;

at second, in section 9. of the Declaration at pages 11-15, the person signing the Declaration appears to argue the legal aspects of examination of application, and in particular, "mapping" requirements of the claim limitations onto the cited references. See page 14. It is noted that whether or not rejection of pending claims is proper under MPEP Standards for Patentability is beyond the scope of this Declaration and shall be argued by Applicant's legal representative in Remarks section of Applicant's reply, not by a third party technical expert;

at last, the substance of the Declaration amounts to a general allegation of patentable distinction between the claimed invention and the closest prior art of record. In particular, the Declaration contains only the opinion of the person signing the Declaration. See section 10 at pages 15-22. The person signing the Declaration states: *"based on my education and experience, my opinion is that the cited portions of the Reference(s) are, at first sight, on the first appearance, on the face of it, so far as can be judged from the first disclosure, very different on their faces in that the USPTO-*

identified portions of Simon and Madden TAG do not recite the text of at least amended Clause [b] of Independent Claim 1". The Declaration presents no objectively verifiable evidence in the form of facts to support the currently unsupported opinion of the person signing the Declaration. No exhibits have been presented to support the opinion of the person signing the Declaration.

For at least these reasons the Declaration is deficient and arguments presented in the Declaration are not persuasive.

Specification

3. The application contains disclosure entirely outside the bounds of the claims.

Applicant is required to modify the brief summary of the invention and restrict the descriptive matter so as to be in harmony with the claims (MPEP § 1302.01).

In particular, it appears that only disclosure of section II. AGGREGATING MOTE-ASSOCIATED INDEX DATA (pages 14-18 of the specification) and partially the disclosure of section I. MOTE-ASSOCIATED INDEX CREATION (pages pertaining to the description of Fig. 2 and Fig. 4) is relevant to the subject matter of claims 1-39, as presently claimed. The rest of the specification describes the subject matter of the co-pending applications wherein the name of each section in the specification corresponds to the name of each of the co-pending applications. Applicants are reminded that the subject matter of later sections of the specification (sections III, IV, and V.) is actually included through their incorporation by reference of the related/parent applications, as mentioned in the beginning of the specification (pages 1-4). As a result, providing a

detailed description of the subject matter of co-pending applications is redundant and must be removed from the current application.

This objection was requested by applicants to be held in abeyance until allowable subject matter is indicated, pursuant to 37 CFR 1.111(b), in supplemental response dated November 5, 2008.

4. The specification is objected to under 37 CFR 1.75(d)(1) as failing to provide a clear support or antecedent basis in the description for amended claims, as discussed below with respect to the written description requirement.

The specification is further objected to under 37 CFR 1.75(d)(1) as failing to provide a clear support or antecedent basis in the description for "exposing" and "expose" as claimed in the independent claims 1, 17, and 34.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 38 and 39 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

As to claim 38, the limitation of "one or more indicators of a second mote's content to be indexed, the one or more indicators being received from the second mote and excluding the second mote's content" has not been described in the specification. In particular, it has nowhere been disclosed that received data from the second mote includes second mote's indicators but excludes second mote's content.

As to claim 39, the limitation of "one or more mote-network addresses of the second mote's content to be indexed comprising a list of sensing capabilities or control capabilities of the second mote, and associated device-identifiers associated with one or more devices present or available at the second mote" has not been described in the specification. In particular, it has nowhere been disclosed that mote-network addresses comprise a list of sensing capabilities or control capabilities.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claims 1, 17, 33, and 34, the limitation of "the first (second) set of motes is administered by a first (second) network administrator owned or controlled by a first (second) business entity" is ambiguous because it is unclear whether a set of motes is owned/controlled by a business entity or a network administrator is owned/controlled by a business entity. Appropriate correction or explanation is required.

As to claims 4-7, it is unclear whether step of "obtaining" further limits the step of aggregating or the step of creating, as in claim 3.

As to claim 8, it is unclear whether "receiving at least a part of at least one of a mote-addressed sensing index or a mote-addressed control index from a reporting entity at a mote of the first set of motes" further limits the step of aggregating or the step of creating, as in claim 3.

As to claim 9, it is unclear whether "receiving at least a part of at least one of a mote-addressed routing index from a reporting entity at a mote of the first set of motes" further limits the step of aggregating or the step of creating, as in claim 3.

As to claims 18-32, the structure disclosed in the written description of the specification is the corresponding structure only if the written description of the specification or the prosecution history **clearly links or associates** that structure to the function recited in a means-plus-function claim limitation under 35 U.S.C. 112, sixth paragraph. The requirement that a particular structure be clearly linked with the claimed function in order to qualify as corresponding structure is the *quid pro quo* for the convenience of employing 35 U.S.C. 112, sixth paragraph, and is also supported by the requirement of 35 U.S.C. 112, second paragraph, that an invention must be particularly pointed out and distinctly claimed. For a means plus function claim limitation that

invokes 35 U.S.C. 112, sixth paragraph, a rejection under 35 U.S.C. 112, second paragraph, is appropriate if one of ordinary skill in the art cannot identify what structure, material, or acts disclosed in the written description of the specification perform the claimed function.

In the instant case, claim elements “means for receiving”, “means for creating”, “means for aggregating”, “means for installing”, and “means for obtaining” are a means plus function limitations that invoke 35 U.S.C. 112, sixth paragraph. However, the written description fails to clearly link or associate the disclosed structure, material, or acts to the claimed function such that one of ordinary skill in the art would recognize what structure, material, or acts perform the claimed function.

Applicant is required to:

(a) Amend the claims so that the claim limitation will no longer be a means plus function limitation under 35 U.S.C. 112, sixth paragraph; or

(b) Amend the written description of the specification such that it clearly links or associates the corresponding structure, material, or acts to the claimed function without introducing any new matter (35 U.S.C. 132(a)); or

(c) State on the record where the corresponding structure, material, or acts are set forth in the written description of the specification that perform the claimed function such that there is a separate structure for each means recitation. For more information, see 37 CFR 1.75(d) and MPEP 2181 and 608.01(o).

It is noted that a bare statement that known techniques or methods can be used would not be a sufficient disclosure. *See In re Donaldson Co.*, 16 F.3d 1189, 1195, 29

USPQ2d 1845, 1850 (Fed. Cir. 1994) (in banc); and *Biomedino, LLC v. Waters Technology Corp.*, 490 F.3d 946, 952, 83 USPQ2d 1118, 1123 (Fed. Cir. 2007).

A rejection under 35 U.S.C. 112, second paragraph, is appropriate if the written description of the specification discloses no corresponding algorithm. See *Aristocrat*, 521 F.3d at 1337-38, 86 USPQ2d at 1243. For example, merely referencing to a general purpose computer with appropriate programming without providing any detailed explanation of the appropriate programming See *Id.* at 1334, 86 USPQ2d at 1240, or simply reciting software without providing some detail about the means to accomplish the function See *Finisar*, 523 F.3d at 1340-41, 86 USPQ2d at 1623, would not be an adequate disclosure of the corresponding structure to satisfy the requirements of 35 U.S.C. 112, second paragraph, even when one of ordinary skill in the art is capable of writing the software to convert a general purpose computer to a special purpose computer to perform the claimed function.

To this extent, reference to a general purpose "electric circuitry" as made at pages 41-42 of the specification that mentions how *"those skilled in the art will recognize that the various aspects described herein which can be implemented, individually and/or collectively, by a wide range of hardware, software, firmware, or any combination thereof can be viewed as being composed of various types of "electrical circuitry"* fails to reasonably convey to one of ordinary skill in the art that the inventors, at the time the application was filed, had an adequate disclosure of the corresponding structure as containing electrical circuitry required to satisfy the requirements of 35 USC 112, second paragraph, even if one of ordinary skill in the art is capable of producing

the special purpose electrical circuitry from the general purpose electrical circuitry to perform the claimed function.

As to claim 35, it is unclear which content indexes from the first set of notes of claim 34 are the "indexed note-addressed content indexes". It is further unclear whether a "computing device" is the same as an "aggregator" of claim 34. Based on claimed functionality, it appears that the aggregator and the computing device of claim 35 refer to the same element disclosed in the specification. Therefore, usage of inconsistent terminology when referring the same element in the claim is ambiguous.

As to claim 39, it is unclear how can network addresses comprise a list of sensing capabilities or control capabilities of the second note, and associated device-identifiers associated with one or more devices present or available at the second note. It appears based on the specification that network address and other claimed elements are independent from each other. Appropriate correction or explanation is required.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-4, 7, 8, 10, 11, 13, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. (US 2002/0161751 A1) in view of Simon et al. (US Patent 7,665,126 B2).

As to claim 1, Mulgund teaches:

aggregating at least a part of one or more mote-addressed content indexes from a first set of motes [aggregating indexing information related to sensor data outputs stored in Sensor Data Table 24. It is well known to one of ordinary skill in the art that such indexing data allows one to distinguish between different sensor data outputs, as discussed in connection with relational databases of Figs. 3 and 4] (abstract, par. [0005] and [0025], Fig. 3, Fig. 4), wherein the first set of motes [nodes to the left of Fig. 1] is administered by a first network administrator [first network access point to the left of Fig. 1] to form a first aggregated mote-addressed content index (Fig. 3); and

exposing [making available] at least a part of the first aggregated mote-addressed content index to an aggregator [database server 10] of (i) a first-set content index from the first set of motes [nodes to the left of Fig. 1] administered by the first network administrator [first network access point to the left of Fig. 1] and (ii) a second set content index from a second set of motes [nodes to the right of Fig. 1] administered by a second network administrator [second network access point to the right of Fig. 1].

It is noted that (i) and (ii) is a non-functional descriptive material since it does not further limit either aggregating or exposing step.

Mulgund is silent as to whether the first and second network access points are owned or controlled by different business entities.

Simon is directed to a method of controlling access of mesh routers to a network resources based on information contained in a certificate associated with the particular router. See abstract. Simon teaches the first set of devices (104C) is administered by a first network administrator (102C) controlled by a first business entity [mesh router 102C is controlled by the associated certificate (202C)] and wherein the second set of devices (104B) is administered by a second network administrator (102B) controlled by a second business entity [mesh router 102B is controlled by the associated certificate (202B)] (Figs. 1 and 2; col. 3 lines 4-18; col. 4 lines 23-32).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by having the first and second network access points being owned or controlled by different business entities in order to introduce control and/or accountability into spontaneously-formed wireless networks (col. 1 lines 43-45 of Simon).

As to claim 2, Mulgund teaches:

receiving at least a part of one or more mote-addressed indexes of the first set of motes [retrieving the information stored at the nodes] (par. [0025], [0062]).

As to claim 3, Mulgund teaches:

aggregating at least a part of one or more mote-addressed content indexes from the first set of motes, as discussed per claim 1, the content indexes comprising information indicating a first type of sensing or control capabilities associated with the

first set of motes [indexing information of Mulgund includes node's unique address, wherein it is known a priori what type of output a particular node provides. Each Node Data Table contains node's unique address, which identifies a sensing function of that node] and a second type of sensing or control capabilities associated with the first set of motes [different nodes in the set have different sensors installed and thus provide different amount and type of data output] (par. [0029], [0042]); and

creating one or more multi-mote content indexes of the first set of motes (Fig. 4, par. [0042]).

As to claim 4, Mulgund teaches:

obtaining a listing of motes appropriate to at least one of the one of more multi-mote content indexes (pars [0035] and [0037]).

As to claim 7, Mulgund teaches:

obtaining a listing of motes appropriate to at least one of the one or more multi-mote content indexes (pars [0035] and [0037]) from one or more motes to be included in the listing (par. [0061] and [0062]) wherein the second column in table 1 (CAL) shows the current links from the Node being visited.

As to claim 8, Mulgund teaches:

receiving at least a part of at least one of a mote-addressed sensing index from a reporting entity at a mote [knowledge base and API] of the first set of motes [retrieving the information stored at the nodes] (par. [0025], [0062]).

As to claim 10, Mulgund teaches:

receiving from the first set of motes at least a part of one or more content indexes of the first set of motes, as discussed per claims 2 and 8, above.

As to claim 11, Mulgund teaches:

receiving at least a part of at least one of a mote-addressed sensing index from a multi-mote reporting entity at a mote of the first set of motes, as discussed per claims 2 and 8, above.

As to claim 13, Mulgund teaches:

creating an aggregate of at least a part of the one or more content indexes from the first set of motes (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4), wherein the one or more content indexes from the first set of motes include identifiers of devices available at a mote of the first set of motes, and information indicating sensing and control capabilities associated with the devices [indexing information of Mulgund includes node's unique address, wherein it is known a priori what type of output a particular node provides. Each Node Data Table contains node's unique address, which identifies a sensing function of that node] (par. [0029], [0042]).

As to claim 33, Mulgund teaches:

a computer system to aggregate at least a part of one or more mote-addressed content indexes corresponding to content of a first type from a first set of motes [database server 10 for aggregating indexing information related to sensor data outputs stored in Sensor Data Table 24. It is well known to one of ordinary skill in the art that such indexing data allows one to distinguish between different sensor data outputs, as discussed in connection with relational databases of Figs. 3 and 4] (abstract, par. [0005] and [0025], Figs. 2-4), wherein the first set of motes [nodes to the left of Fig. 1] is administered by a first network administrator [first network access point to the left of Fig. 1] and to aggregate at least a part of one or more mote-addressed content indexes corresponding to content of a second type from a second set of motes [each Node Data Table contains node's unique address, which identifies a sensing function of that node] (par. [0029], [0042] in Mulgund), the second set of motes [nodes to the right of Fig. 1] administered by a second network administrator [second network access point to the right of Fig. 1], the motes in the first set of motes and the second set of motes comprising a device formed in a substrate having at least two of a semi-autonomous computing functionality, a communication functionality, or a sensing functionality [at least one sensing node (2) in the first set of sensing nodes (Fig. 1) comprising a computational device being a small embedded platform that has one or more sensors (16)] (par. [0026]), said computer system to aggregate data from a first and second reporting entity [knowledge base and API] (par. [0026]), said first reporting entity being

operable to report an aggregation of at least a part of one or more mote-addressed content indexes from the first set of motes [software API allows the network modeling agent to access a node on the network and retrieve information stored in a knowledge base (18) of the node] (par. [0026], [0044], [0030]), and said second reporting entity being operable to report an aggregation of at least a part of one or more mote-addressed content indexes from the second set of motes (par. [0030]).

Mulgund is silent as to whether the first and second network access points are owned or controlled by different business entities.

Simon is directed to a method of controlling access of mesh routers to a network resources based on information contained in a certificate associated with the particular router. See abstract. Simon teaches the first set of devices (104C) is administered by a first network administrator (102C) controlled by a first business entity [mesh router 102C is controlled by the associated certificate (202C)] and wherein the second set of devices (104B) is administered by a second network administrator (102B) controlled by a second business entity [mesh router 102B is controlled by the associated certificate (202B)] (Figs. 1 and 2; col. 3 lines 4-18; col. 4 lines 23-32).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by having the first and second network access points being owned or controlled by different business entities in order to introduce control and/or accountability into spontaneously-formed wireless networks (col. 1 lines 43-45 of Simon).

11. Claims 9, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Simon et al. and in further view of "TAG: a Tiny Aggregation Service for Ad-Hoc Sensor Networks" by Samuel Madden et al. (hereinafter *Madden TAG*).

As to claim 9, Mulgund teaches all the elements except for receiving at least a part of at least one of a mote-addressed routing index from a reporting entity at a mote of the first set of motes.

Madden TAG teaches receiving at least a part of at least one of a mote-addressed routing index from a reporting entity at a mote of the first set of motes (section 2.1 Ad-Hoc Routing Algorithm of Madden).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Simon by receiving at least a part of at least one of a mote-addressed routing index from a reporting entity at a mote of the first set of motes in order to build a routing tree (section 2.1 Ad-Hoc Routing Algorithm of Madden).

As to claim 14, Mulgund teaches all the elements except for aggregating at least a part of a mote-addressed routing index of a content index of the first set of motes.

Madden TAG teaches aggregating at least a part of a mote-addressed routing index of a content index of the first set of motes (section 2.1 Ad-Hoc Routing Algorithm of Madden).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Simon by aggregating at least a part of a mote-addressed routing index of a content index of the first set of motes in order to build a routing tree (section 2.1 Ad-Hoc Routing Algorithm of Madden).

As to claim 15, Mulgund in view of Simon and Madden TAG teaches aggregating at least a part of a mote-addressed routing of a multi-mote content index (section 2.1 Ad-Hoc Routing Algorithm of Madden).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Simon by aggregating at least a part of a mote-addressed routing of a multi-mote content index in order to build a routing tree (section 2.1 Ad-Hoc Routing Algorithm of Madden).

12. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Simon et al. in view of Madden TAG and in further view of Chiloyan et al. (US Patent No.: 7,165,109).

As to claim 5, Mulgund teaches:

a listing of motes appropriate to at least one of the one or more multi-mote content indexes (pars [0035] and [0037]) from a multi-mote registry [Nodes Table (20)].

Chiloyan further teaches:

obtaining a listing of devices from a registry [having an operational system accessing device registry to check if the particular peripheral device model is included in the current device registry] (col. 1 lines 50-65).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Simon by obtaining a list of devices from a registry in order to check if the particular device model and necessary information about the device is in the registry (col. 1 lines 58-63 in Chiloyan).

As to claim 6, Mulgund teaches:

a pre-loaded listing of notes [initial model construction listing] (par. [0046]) appropriate to at least one of the one or more multi-note content indexes (par. [0035] and [0037]).

Chiloyan further teaches:

obtaining a pre-loaded listing of devices [devices already included in the current device registry] (col. 1 lines 50-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Simon by obtaining a pre-loaded list of devices in order to check if the particular device model and necessary information about the device is already included in the registry (col. 1 lines 58-63 in Chiloyan).

13. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Simon et al. in view of Madden TAG and in further view of News

Release article titled "Tiny Sensor-Based Computers Could Help Track Wildlife" dated Nov. 6, 2003 (hereinafter *News Release*) (cited in IDS dated 12/18/09).

As to claim 12, Mulgund in view of Simon and Madden TAG teaches receiving at least a part of a mote-addressed routing index from a multi-mote reporting entity at a mote of the first set of motes (section 2.1 Ad-Hoc Routing Algorithm of Madden).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Simon by receiving at least a part of a mote-addressed routing index from a multi-mote reporting entity at a mote of the first set of motes in order to build a routing tree (section 2.1 Ad-Hoc Routing Algorithm of Madden).

Mulgund in view of Simon and Madden does not expressly teach receiving a mote-addressed spatial index.

News Release teaches receiving a mote-addressed spatial index from a multi-mote reporting entity [computer base station receiving GPS sensor's readings that are stored in mote's memory] (par. 5 and 6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Simon and Madden by receiving a mote-addressed spatial index from a multi-mote reporting entity in order to effectively track the location of the mote in space and the entity to which the mote is attached to (par. 1-6 in News Release).

14. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Simon et al. in view of "TinyDB: In-Network Query Processing in TinyOS" by Sam Madden (hereinafter *Madden TinyDB*) (see IDS dated 06/17/09 cite # AK) and in further view of "Mate: A Tiny Virtual Machine for Sensor Networks" by Levis et al. (see IDS dated 04/22/04 cite # AZ).

As to claim 16, Mulgund in view of Simon does not teach transferring a multi-mote index creation agent, which aggregates at least a part of one or more mote-addressed content indexes received from a first mote of the first set of motes, to a second mote of the first set of motes.

Madden TinyDB teaches that the TinyDB component is installed directly onto the mote by connecting the mote to the programming board (see page 8).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have a TinyDB component installed on the nodes of Mulgund in order to lower the number of message transmissions, latency, and power consumption comparing to the server-based approach of Mulgund (Madden TAG, section 4 under In-Network Aggregates).

Levis discusses a tiny virtual machine for sensor networks. In particular, Levis teaches packet sending and reception capsules that enable the deployment of ad-hoc routing and data aggregation algorithms. (see abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Simon and Madden TinyDB by transferring the multi-mote index creation agent (TinyDB component) from one mote to

another mote, as taught by Levis (see section 4.4 Code Infection) in order to reprogram motes in the network when they are physically unreachable (i.e. can't be connected directed to the programming board, as taught by Madden TinyDB) (abstract of Levis).

It is noted that claim language "for installation" and "for receipt" indicates intended use. Therefore, these limitations are not given patentable weight. To that extend, a TinyDB installed on a mote is for installation [a TinyDB, which is a distributed query processor that runs on each of the nodes in a sensor network and is a TinyOS component] (section 2 Introduction, page 5 of Madden TinyDB) and for receipt of at least a part of one or more mote-addressed content indexes of the second mote with the multi-mote index creation agent installed on the first mote (section 2.1 System Overview, page 7 of Madden TinyDB).

15. Claims 17-32 and 34-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of "The Design of an Acquisitional Query Processor For Sensor Networks" by Samuel Madden et al. (hereinafter *Madden ACQP*) and in further view of Simon et al.

As to claim 17, Mulgund teaches a mote, wherein the mote comprises a device formed in a substrate having at least two of a semi-autonomous computing functionality, a communication functionality, or a sensing functionality [at least one sensing node (2) in the first set of sensing nodes (Fig. 1) comprising a computational device being a small embedded platform that has one or more sensors (16)] (par. [0026]);

an agent [sensor network modeling agent (14)] (Fig. 1) to aggregate in a first set of nodes at least a part of one or more mote-addressed content indexes corresponding to a first type of content of content [type of data output provided by each sensor of the node] (par. [0026], [0029] in Mulgund) from the first set of nodes [aggregating indexing information related to sensor data outputs stored in Sensor Data Table 24. It is well known to one of ordinary skill in the art that such indexing data allows one to distinguish between different sensor data outputs, as discussed in connection with relational databases of Figs. 3 and 4] (abstract, par. [0005] and [0025], Figs. 3 and 4) administered by a first network administrator [set of nodes at the left of Fig. 1 is administered by a first network access point], to aggregate at least a part of the one or more first mote-addressed content indexes corresponding to a second type of content from the second set of nodes to form a first aggregated mote-addressed content index [as discussed per first set, wherein Mulgund teaches having two sets of nodes] (Fig. 3), and to expose [make available] at least a part of the first aggregated mote-addressed content index to an aggregator [database server 10] that aggregates (i) a first-set content index from the first set of nodes [nodes to the left of Fig. 1] administered by the first network administrator [first network access point to the left of Fig. 1] and (ii) a second set content index from a second set of nodes [nodes to the right of Fig. 1] administered by a second network administrator [second network access point to the right of Fig. 1].

It is noted that (i) and (ii) is a non-functional descriptive material since it does not further limit either aggregating or exposing step.

Mulgund is silent as to whether the first and second network access points are owned or controlled by different business entities. Mulgund further does not teach that an agent is on the mote. Mulgund, however, teaches that each node contains some local memory or other knowledge base for recording sensor output data, which can be retrieved by interrogating the node (par. [0030]), which suggests to one of ordinary skill in the pertinent art that there exists some *agent resident in a mote* that collects data from sensors and stores it in the local knowledge base.

Madden ACQP teaches an agent resident in a mote [a TinyDB, which is a distributed query processor that runs on each of the nodes in a sensor network] (section 1 Introduction, par. 4), the agent to perform the functionality of aggregating and exposing substantially as claimed.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by having an agent resident in the mote in order to select, join, project, and aggregate data from the sensors (section 1 Introduction, par. 4 in Madden).

Simon is directed to a method of controlling access of mesh routers to a network resources based on information contained in a certificate associated with the particular router. See abstract. Simon teaches the first set of devices (104C) is administered by a first network administrator (102C) controlled by a first business entity [mesh router 102C is controlled by the associated certificate (202C)] and wherein the second set of devices (104B) is administered by a second network administrator (102B) controlled by a

second business entity [mesh router 102B is controlled by the associated certificate (202B)] (Figs. 1 and 2; col. 3 lines 4-18; col. 4 lines 23-32).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Madden ACQP by having the first and second network access points being owned or controlled by different business entities in order to introduce control and/or accountability into spontaneously-formed wireless networks (col. 1 lines 43-45 of Simon).

As to claims 18-32, Mulgund in view of Madden ACQP and Simon provide corresponding means [a network modeling agent of Mulgund and a TinyDB component of Madden] as a structure for performing the claimed functionality, wherein the functionality was discussed per corresponding method claims.

As to claim 34, Mulgund teaches:

a first mote of a plurality of motes, the first mote comprising a device formed in a substrate having at least two of a semi-autonomous computing functionality, a communication functionality, or a sensing functionality [at least one sensing node (2) in the first set of sensing nodes (Fig. 1) comprising a computational device being a small embedded platform that has one or more sensors (16)] (par. [0026]); and

a first multi-mote index creation agent [sensor network modeling agent (14)] (Fig. 1), the first set of motes administered by a first network administrator [first network access point to the left of Fig. 1], said first multi-mote index creation agent configured to

(a) aggregate at least a part of at least a part of a first mote-addressed content index including an index of content of the first set of motes of the plurality of motes to form a first aggregated mote-addressed content index [network modeling agent creates a relational database containing indexing information related to sensor data outputs stored in Sensor Data Table 24. It is well known to one of ordinary skill in the art that such indexing data allows one to distinguish between different sensor data outputs, as discussed in connection with relational databases of Figs. 3 and 4] (Fig. 3 and par. [0037]), and (b) expose [make available] at least a part of the first aggregated mote-addressed content index to an aggregator [database server 10] of (i) a first-set content index from the first set of motes [nodes to the left of Fig. 1] administered by the first network administrator [first network access point to the left of Fig. 1] and (ii) a second set content index from a second set of motes [nodes to the right of Fig. 1] administered by a second network administrator [second network access point to the right of Fig. 1].

It is noted that (i) and (ii) is a non-functional descriptive material since it does not further limit either aggregating or exposing step.

Mulgund is silent as to whether the first and second network access points are owned or controlled by different business entities.

Mulgund also teaches that each node contains some local memory or other knowledge base for recording sensor output data, which can be retrieved by interrogating the node (par. [0030]), which suggests to one of ordinary skill in the pertinent art that there exists some *agent resident in a mote* that collects data from

sensors and stores it in the local knowledge base. However, such local agent, *per se*, is not explicitly shown.

Madden shows a multi-mote index creation agent resident in a mote [a TinyDB, which is a distributed query processor that runs on each of the nodes in a sensor network] (section 1 Introduction, par. 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by having a multi-mote index creation agent being resident in the mote in order to select, join, project, and aggregate data from the sensors (section 1 Introduction, par. 4 in Madden).

Simon is directed to a method of controlling access of mesh routers to a network resources based on information contained in a certificate associated with the particular router. See abstract. Simon teaches the first set of devices (104C) is administered by a first network administrator (102C) controlled by a first business entity [mesh router 102C is controlled by the associated certificate (202C)] and wherein the second set of devices (104B) is administered by a second network administrator (102B) controlled by a second business entity [mesh router 102B is controlled by the associated certificate (202B)] (Figs. 1 and 2; col. 3 lines 4-18; col. 4 lines 23-32).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Madden by having the first and second network access points being owned or controlled by different business entities in order to introduce control and/or accountability to spontaneously-formed wireless networks (col. 1 lines 43-45 of Simon).

As to claim 35, Mulgund teaches a computing device configured to aggregate at least a part of the indexed mote-addressed content indexes from the first set of motes and the second set of motes [database server 10] (Fig. 1).

As to claim 36, Mulgund in view of Madden teaches:

a processor (section 2.1 Properties of Sensor Devices, par. 2 in Madden) configured to execute the at least one multi-mote index creation agent to obtain at least a sensing function (par. [0042] lines 16-19 in Mulgund).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Mulgund to include a processor in order to process data that is being stored in a knowledge base and respond to interrogation requests (Fig. 2 in Mulgund).

As to claim 37, Mulgund in view of Madden teaches that said first mote comprises a processor, a memory, and a communications devices formed from a substrate (par. [0026] in Mulgund; section 2.1 in Madden).

16. Claims 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Madden ACQP.

As to claim 38, Mulgund teaches:

a first mote [node (2)] (Fig. 1) comprising a first content type [type of data output provided by each sensor of the node] (par. [0026], [0029] in Mulgund) and administered by a first network administrator [first network access point at the left of Fig. 1], the first mote comprising a device formed in a substrate having at least two of a semi-autonomous computing functionality, a communication functionality, or a sensing functionality [at least one sensing node (2) in the first set of sensing nodes (Fig. 1) comprising a computational device being a small embedded platform that has one or more sensors (16)] (par. [0026]); and

at least one multi-mote registry [Nodes Table (20)], said at least one multi-mote registry having one or more indicators of a second mote's content to be indexed (par. [0037], [0061] and [0063], second column (CAL) in table 1), the one or more indicators being received from the second mote and excluding the second mote's content [indicators are a distinct entity from mote's content, and when received, are easily distinguished from the mote's content either by a computer program or visually], said second mote's content to be indexed comprising a second content type [type of data output provided by each sensor of the node] (par. [0026], [0029] in Mulgund).

Mulgund does not teach that at least one multi-mote registry is resident in said first mote.

Madden ACQP teaches a multi-mote registry [a short list] resident in a mote (under 2.2 Communication in Sensor Networks, par. 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by having a multi-mote registry resident in

the mote in order to keep a list of neighbors who they have heard transmit recently, as well as some routing information about the connectivity of those neighbors (under 2.2 Communication in Sensor Networks, par. 2) (analogous to information about child nodes in Mulgund, Table 1, second column).

As to claim 39, this claim is examined as best understood. Mulgund teaches that the one or more indicators of a second mote's content to be indexed comprise one or more mote-network addresses of the second mote's content to be indexed [unique address of a node that stores node's content] (par. [0037]).

Conclusion

17. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to OLEG SURVILLO whose telephone number is (571)272-9691. The examiner can normally be reached on M-Th 9:30am - 7:00pm; F 10:00am - 6:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenton B. Burgess can be reached on 571-272-3949. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Oleg Survillo
Phone: 571-272-9691

/KEVIN BATES/
Primary Examiner, Art Unit 2456

